IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently amended) A method, comprising extending-a digital subscriber loop including:

producing an output signal in a first direction from a first variable gain amplifier at a mid-span extender unit responsive to an input signal in the first direction from said digital subscriber loop;

monitoring a signal strength of said output signal in the first direction at said mid-span extender unit;

generating a gain control signal responsive to said signal strength at said mid-span extender unit; ~~and~~

controlling a first gain of said first variable gain amplifier at said mid-span extender unit responsive to said gain control signal; and

controlling a second gain of a second variable gain amplifier at said mid-span extender unit responsive to said gain control signal to produce an output signal in a second direction from said second variable gain amplifier at said mid-span extender unit responsive to a second input signal in said second direction from said digital subscriber loop.

2. (Currently amended) The method of claim 1, wherein said input signal in the first direction originates from a customer-premise side of said digital subscriber loop.

3. (Currently amended) The method of claim 1, wherein said input signal in the first direction originates from a central office side of said digital subscriber loop.

4-5. (Canceled)

6. (Original) The method of claim 1, wherein monitoring includes monitoring said signal strength using a peak detector circuit.

7. (Original) The method of claim 1, wherein generating said gain control signal includes generating said gain control signal using an automatic gain control loop filter.

8. (Currently amended) The method of claim 1, wherein controlling gain of said first variable gain amplifier includes choosing one of eight discrete values of gain.

9. (Currently amended) The method of claim 1, wherein controlling gain of said first variable gain amplifier includes choosing one of four discrete values of gain.

10. (Currently amended) The method of claim 1, wherein controlling gain of said first variable gain amplifier includes choosing one of two discrete values of gain.

11. (Original) The method of claim 1, further comprising detecting whether a downstream signal is present on said digital subscriber loop.

12. (Currently amended) The method of claim 11, wherein controlling said gain of said first variable gain amplifier includes determining when to change said gain based on at least one elapsed time interval selected from the group consisting of Tnormal, Tshutdown, Tsleep, and Tdead, where Tnormal is a duration that persists while i) said downstream signal is

present, and said gain is between a lower threshold and an upper threshold, or ii) said downstream signal is present, an upstream power level is below a lower threshold, and said gain is at an upper limit, or iii) said downstream signal is present, said upstream power level is above an upper threshold, and said gain is at a lower limit, where Tshutdown is a maximum duration of link termination, where Tsleep is a subsequent duration, and where Tdead is a duration that persists with a same gain setting while said downstream signal is not present and a control signal is below a low threshold.

13. (Currently amended) The method of claim 11, wherein controlling said gain of said first variable gain amplifier includes changing said gain within a range defined by an upper limit and a lower limit if said downstream signal is not present, said gain control signal is below a low threshold, and a time interval Tdead has elapsed, where Tdead is a duration that persists with a same gain setting while said downstream signal is not present and said control signal is below said low threshold.

14. (Currently amended) The method of claim 11, wherein controlling said gain of said first variable gain amplifier includes increasing said gain if said downstream signal is present, said gain control signal is below a low threshold, and a time interval Tup has elapsed, where Tup is a duration persists while said downstream signal is present and said gain control signal is below said low threshold.

15. (Currently amended) The method of claim 11, wherein controlling said gain of said first variable gain amplifier includes decreasing said gain if said downstream signal is present, said gain control signal is above a high threshold, and a time interval Tdown has

elapsed, where Tdown is a duration that persists while said downstream signal is present and said gain control signal is above said high threshold.

16. (Currently amended) The method of claim 11, wherein controlling gain of said first variable gain amplifier includes forcing a link termination.

17. (Currently amended) The method of claim 11, wherein controlling said gain of said first variable gain amplifier includes reestablishing a link.

18-19. (Canceled)

20. (Currently amended) A method, comprising extending a digital subscriber loop including:

splitting a transmission medium at a point between a first end and a second end to deploy a mid-span extender unit ~~repeater~~ circuit, said mid-span extender unit ~~repeater~~ circuit having a first variable gain amplifier and a second variable gain amplifier, said first variable gain amplifier having a first gain and said second variable gain amplifier having a second gain;

coupling said mid-span extender unit ~~repeater~~ circuit to said transmission medium;

providing an output signal from said first variable gain amplifier, said output signal having a signal strength as a function of said first gain;

utilizing a controller coupled to both said first variable gain amplifier and said second variable gain amplifier, said controller having a peak detector coupled to a loop filter, said peak detector monitoring said signal strength of said output signal at said mid-span extender unit, and said loop filter generating a gain control signal at said mid-span extender unit, said gain control

signal feedback to both said first variable gain amplifier and said second variable gain amplifier at said mid-span extender unit;

automatically controlling said first gain of said first variable gain amplifier at said mid-span extender unit responsive to said gain control signal while transmitting a first communication in ~~said~~ a first direction, said first communication within a first frequency range, over said transmission medium from said first end to said second end; and

automatically controlling said second gain of said second variable gain amplifier at said mid-span extender unit responsive to said gain control signal while transmitting a second communication in ~~said~~ a second direction, said second communication within a second frequency range, over said transmission medium from said second end to said first end.

21. (Original) The method of claim 20, wherein generating said gain control signal includes establishing a control voltage as a function of said signal strength of said output signal.

22. (Currently amended) An apparatus, comprising a digital subscriber loop extender circuit including:

a variable gain amplifier having a gain and providing an output signal in a direction in response to an input signal from a signal generator over a transmission medium, said output signal having a signal strength as a function of said gain;

another variable gain amplifier having another gain and providing another output signal in another direction in response to another input signal from another signal generator over said transmission medium, the another output signal having another signal strength as another function of the another gain; and

a controller coupled to said variable gain amplifier, said controller generating a gain control signal that is both i) feed back to said variable gain amplifier to automatically control said gain and ii) feed back to said another variable gain amplifier to automatically control said another gain.

23. (Currently amended) An ~~The~~ apparatus ~~of claim 22~~, ~~further~~ comprising a digital subscriber loop extender circuit including:

a variable gain amplifier having a gain and providing an output signal in response to an input signal from a signal generator over a transmission medium, said output signal having a signal strength as a function of said gain;

a controller coupled to said variable gain amplifier, said controller generating a gain control signal that is feed back to said variable gain amplifier to automatically control said gain; and

another variable gain amplifier coupled to said controller, the another variable gain amplifier having another gain and providing another output signal in response to another input signal from another signal generator over said transmission medium, the another output signal having another signal strength as another function of the another gain.

24. (Original) An ~~The~~ apparatus ~~of claim 22~~, ~~further~~ comprising a digital subscriber loop extender circuit including:

a variable gain amplifier having a gain and providing an output signal in response to an input signal from a signal generator over a transmission medium, said output signal having a signal strength as a function of said gain;

a controller coupled to said variable gain amplifier, said controller generating a gain control signal that is feed back to said variable gain amplifier to automatically control said gain;

another variable gain amplifier coupled to said controller, the another variable gain amplifier having another gain and providing another output signal in response to another input signal from another signal generator over said transmission medium, the another output signal having another signal strength as another function of the another gain; and

another controller coupled to the another variable gain amplifier, the another controller generating another gain control signal that is feed back to the another variable gain amplifier to automatically control the another gain.

25. (Currently amended) The apparatus of claim 22, wherein said controller includes a peak detector and a loop filter, said peak detector monitoring said signal strength of said output signal, and said loop filter coupled to said peak detector to generate said gain control signal~~, said gain control signal feedback to said first variable gain amplifier for automatically controlling said first gain, and said gain control signal feedback to said second variable gain amplifier for automatically controlling said second gain~~.

26. (Original) The apparatus of claim 22, further comprising said signal generator, wherein said signal generator includes a discrete multi-tone asymmetric digital subscriber loop transmission unit.

27. (Original) The apparatus of claim 22, further comprising said transmission medium, wherein said transmission medium includes an asymmetric digital subscriber loop.

28. (Currently amended) The apparatus of claim 22, wherein said digital subscriber loop extender circuit is interposed at an intermediate point of ~~said~~ an asymmetric digital

subscriber loop to extend said asymmetric digital subscriber loop, wherein said intermediate point lies between a provider end and a subscriber end.

29. (Original) The apparatus of claim 28, wherein said intermediate point is flexibly located by splitting said asymmetric digital subscriber loop into a first portion and a second portion, said first portion defining a first loop length between a central office end and said digital subscriber loop extender and said second portion defining a second loop length between said digital subscriber loop extender and said subscriber end, wherein said gain is a function of said second loop length.

30. (Original) The apparatus of claim 22, wherein said variable gain amplifier includes a voltage-controlled amplifier chain.

31-41. (Canceled)